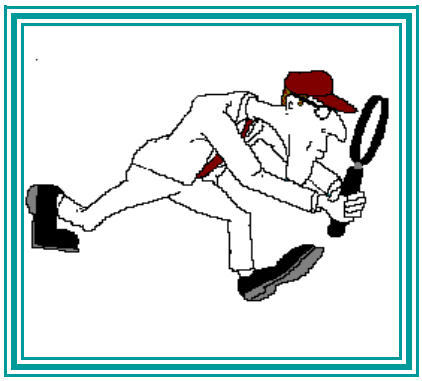
Hemophilia Surveillance System Report



Hemophilia cases identified 1993-1995 Volume 1, No. 1

Contents

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Single copies of the *Hemophilia Surveillance System Report* are available free from HANDI, the information service of the National Hemophilia Foundation by calling (800) 42-HANDI. Confidential information, referrals, and educational material on hemophilia and other bleeding disorders is also available through HANDI. The *Hemophilia Surveillance System Report* is accessible via internet at www.cdc.gov/scientific.htm.

Commentary

Hemophilia is an ancient disease which has been recognized for thousands of years. It is caused by a mutation in one of the two genes located on the x chromosome that contain the genetic code for factor VIII and factor IX -- proteins necessary for normal blood clotting. A deficiency of factor VIII is referred to as hemophilia A or "classic" hemophilia; a deficiency of factor IX characterizes hemophilia B, also known as Christmas disease. Because the defect occurs on the x chromosome (which is one of the chromosomes that determines a person's sex), almost all of the persons most severely affected by hemophilia are men.

People with hemophilia can develop serious bleeding into tissues, muscles, and joints, often without any noticeable trauma. Repeated bleeding into joints results in crippling chronic joint disease, one of the most severe complications of hemophilia. In the mid-1970's, treatment for hemophilia was improved through the use of clotting factor concentrates, products made from the plasma of donated blood. However, since thousands of blood donations are often required to obtain sufficient plasma to manufacture these products, many persons with bleeding disorders became infected with hepatitis B and C virus and human immunodeficiency virus (HIV), the virus that causes AIDS, in the early 1980s before the risk of such transmission was recognized and eliminated.

Since 1986, CDC has been involved with the hemophilia community, primarily through risk-reduction efforts aimed at preventing secondary infection of family members with hepatitis virus or HIV. In 1991, CDC received a request from the National Hemophilia Foundation to expand their collaborative hemophilia activities. Meetings with patients and hemophilia care providers were held during 1992 to determine the areas of highest priority. Based on recommendations from these constituents, a Congressional mandate was issued to CDC with the goal of reducing the human and financial burden of bleeding disorders by focusing national emphasis on prevention and early intervention. The first phase of this legislative initiative was to establish a surveillance system that would provide data on: a) the prevalence and incidence of hemophilia and its complications; b) the occurrence of complications among this population and the use of health-care resources over time; and c) the social and economic impact of hemophilia and its complications from a population perspective.

During 1993-1994, six surveillance sites were chosen based on an objective review of submitted proposals from state health departments, the data-collection instrument was formalized and pilot tested, and surveillance staff were hired and trained. Hemophilia case identification and data abstraction began in 1995. Information about case definitions, case-finding methods, and the data being abstracted can be found in the Technical Notes of this report.

The Hemophilia Surveillance System (HSS) is the first population-based study of hemophilia in the United States. By mid-1997, data from the medical records of more than 3,000 persons with hemophilia had been abstracted and entered into a computer database. The database will be an invaluable source of information needed to achieve the goal of reducing or preventing the complications of hemophilia.

The purpose of this surveillance report is to disseminate this information to public health workers, health educators and planners, and patients and care providers within the hemophilia community. This initial report contains information about the occurrence of hemophilia

and about infection with HIV and mortality among persons with hemophilia residing in the surveillance states. Subsequent reports will include additional information such as sources of medical care, resource use, and complication rates. We hope that this information will prove useful to those involved in efforts to reduce or prevent the complications of this disease.

The proper interpretation and appropriate use of surveillance data require an understanding of how the data are collected, reported, and analyzed. Therefore, readers of this report are encouraged to review the Technical Notes, beginning on page 12.

Suggested Reading:

CDC. Hepatitis A among persons with hemophilia who received clotting factor concentrate - United States, September-December 1995. *MMWR* 1996;45:29-32.

CDC. Prevention of hepatitis A through active or passive immunization. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1996;45(No. RR-15):1-30.

CDC. Transmission of hepatitis C virus infection associated with home infusion therapy for hemophilia. *MMWR* 1997;46:597-599.

Information available from HANDI by calling (800-42-HANDI):

What You Should Know about Bleeding Disorders (1997)

Comprehensive Care for People with Hemophilia by Shelby Dietrich, MD (1991)

Understanding Hepatitis by Leonard Seeff, MD (1997)

HIV Disease in People with Hemophilia: Your Questions Answered by Glenn Pierce, MD, PhD (1991)

Bleeding Disorders and AIDS: The Facts (1997)

Table 1. Number of prevalent male cases of hemophilia A (HemA) and hemophilia B (HemB) identified in six U.S. states during 1993-1995

State of residence	1993 HemA No.	1993 HemB No.	1994 HemA No.	1994 HemB No.	1995 HemA No.	1995 HemB No.
Colorado	177	50	181	51	185	49
Georgia	358	70	389	82	413	89
Louisiana	194	75	196	80	197	82
Massachusetts	305	61	309	61	315	62
New York*	905	253	902	263	902	267
Oklahoma	158	45	158	49	157	52
Total	**2097**	**554**	**2135**	**586**	**2169**	**601**

*Two persons had both hemophilia A and B and are included as cases in both columns for all 3 years.

Table 2. Number of incident male cases of hemophilia A (HemA) and hemophilia B (HemB) identified in six U.S. states during 1993-1995

State of residence	1993 HemA No.	1993 HemB No.	1994 HemA No.	1994 HemB No.	1995 HemA No.	1995 HemB No.
All States**	36	12	35	12	42	9

**Note: The number of cases with birthdates in the year of the surveillance. This number will be an undercount of new cases of hemophilia because a diagnosis of hemophilia is often not made until the child is more than 5 years old, especially for children with mild cases of disease. Since these data were collected during 1994-1997, cases among persons born in 1993-1995 may not yet have been diagnosed.

Table 3. Age distribution of males with hemophilia residing in six U.S. states in 1993

Hemophilia Type		Age Group (years) 0- 4	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Total
A	N	228	242	259	195	182	202	185	150	135	93	68	43	42	29	22	22	2097
	%	10.9	11.5	12.4	9.3	8.7	9.6	8.8	7.2	6.4	4.4	3.2	2.0	2.0	1.4	1.0	1.0	
B	N	67	63	52	56	48	55	51	41	29	31	14	14	12	5	9	7	554
	%	12.1	11.4	9.4	10.1	8.7	9.9	9.2	7.4	5.2	5.6	2.5	2.5	2.2	0.9	1.6	1.3	

Table 4. Age distribution of males with hemophilia residing in six U.S. states in 1994

Hemophilia Type		Age Group (years) 0- 4	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Total
A	N	225	253	264	217	168	192	189	162	135	102	63	40	50	31	21	23	2135
	%	10.5	11.8	12.4	10.2	7.9	9.0	8.8	7.6	6.3	4.8	3.0	1.9	2.3	1.4	1.0	1.1	
B	N	66	74	58	51	57	49	55	40	35	37	17	12	12	6	8	9	586
	%	11.3	12.6	9.9	8.7	9.7	8.4	9.4	6.8	6.0	6.3	2.9	2.0	2.0	1.0	1.4	1.5	

Table 5. Age distribution of males with hemophilia residing in six U.S. states in 1995

Hemophilia Type		Age Group (years) 0- 4	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Total
A	N	239	265	253	237	168	185	179	159	136	119	59	39	50	30	24	27	2169
	%	11.0	12.2	11.7	10.9	7.8	8.5	8.2	7.3	6.3	5.5	2.7	1.8	2.3	1.4	1.1	1.2	
B	N	63	82	61	56	52	51	50	50	35	32	21	13	14	6	8	7	601
	%	10.5	13.6	10.2	9.3	8.6	8.5	8.3	8.3	5.8	5.3	3.5	2.2	2.3	1.0	1.3	1.2	

Table 6. Prevalent male cases of hemophilia A (HemA) and hemophilia B (HemB) identified in six U.S. states during 1993-1995 by race/ethnicity

	1993		1994		1995	
Race/Ethnicity	HemA No.(%)	HemB No.(%)	HemA No.(%)	HemB No.(%)	HemA No.(%)	HemB No.(%)
White	1544 (73.6)	398 (71.8)	1568 (73.4)	415 (70.8)	1575 (72.6)	424 (70.5)
African-American	265 (12.6)	92 (16.6)	271 (12.7)	103 (17.6)	269 (12.4)	108 (18.0)
Hispanic	164 (7.8)	27 (4.9)	171 (8.0)	27 (4.6)	192 (8.8)	30 (5.0)
Native American	14 (0.7)	12 (2.2)	14 (0.7)	12 (2.0)	15 (0.7)	13 (2.2)
Mixed Race	18 (0.9)	7 (1.3)	19 (0.9)	7 (1.2)	19 (0.9)	7 (1.2)
Other*	45 (2.2)	8 (1.4)	46 (2.2)	8 (1.4)	54 (2.5)	9 (1.5)
~~Unknown/Missing~~	~~47 (2.2)~~	~~10 (1.8)~~	~~46 (2.2)~~	~~14 (2.4)~~	~~45 (2.1)~~	~~10 (1.7)~~
Total	**2097**	**554**	**2135**	**586**	**2169**	**601**

*Includes Asian/Pacific Islander

Table 7. Distribution of male hemophilia cases residing in six U.S. states in 1993 by severity level

Hemophilia Type		Severity Level* Mild	Moderate	Severe	Unknown	TOTAL
A	N	616	478	961	42	2097
	%	29.4	22.8	45.8	2.0	
B	N	172	172	197	13	554
	%	31.0	31.0	35.6	2.4	

Table 8. Distribution of male hemophilia cases residing in six U.S. states in 1994 by severity level

Hemophilia Type		Severity Level* Mild	Moderate	Severe	Unknown	TOTAL
A	N	650	492	941	52	2135
	%	30.4	23.0	44.1	2.4	
B	N	186	185	198	17	586
	%	31.7	31.6	33.8	2.9	

Table 9. Distribution of male hemophilia cases residing in six U.S. states in 1995 by severity level

Hemophilia Type		Severity Level* Mild	Moderate	Severe	Unknown	TOTAL
A	N	694	503	918	54	2169
	%	32.0	23.2	42.3	2.5	
B	N	185	193	203	20	601
	%	30.8	32.1	33.8	3.3	

*Mild is factor activity (FA) 6%-30% of normal; Moderate is FA 1%-5% of normal; Severe is FA <1% of normal.

Table 10. HIV serostatus of prevalent male cases of hemophilia A and B identified in six U.S. states during 1993-1995

	1993		1994		1995	
Ever Seropositive	No.	%	No.	%	No.	%
Yes	763	28.8	705	25.9	647	23.4
No	1222	46.1	1288	47.4	1324	47.8
Unknown/Missing*	664	25.1	726	26.7	797	28.8
Total	**2649**		**2719**		**2768**	

*Includes untested.

Table 11. AIDS cases among HIV-seropositive male hemophilia A and B cases during 1993-1995

	1993		1994		1995	
AIDS Case	No.	%	No.	%	No.	%
Yes	209	27.4	191	27.1	188	29.1
No	524	68.7	481	68.2	422	65.2
Unknown	30	3.9	33	4.7	37	5.7
Total	**763**		**705**		**647**	

Table 12. Presence of AIDS indicator disease among HIV-seropositive males with hemophilia A and B identified in six U.S. states during 1993-1995

	1993		1994		1995	
AIDS indicator disease	No.	%	No.	%	No.	%
Yes	33	4.3	33	4.7	27	4.2
No	730	95.7	672	95.3	620	95.8
Total	**763**		**705**		**647**	

Table 13. Annual crude mortality among males with hemophilia A or B identified in six U.S. states during 1993-1995

	1993		1994		1995	
End of year vital status	No.	%	No.	%	No.	%
Alive	2511	96.9	2599	97.2	2650	97.0
Deceased	80	3.1	75	2.8	81	3.0
Total*	**2591**		**2674**		**2731**	

*Excludes cases among persons whose vital status was not known.

Table 14. Number of prevalent female cases* of hemophilia A (HemA) and hemophilia B (HemB) identified in six U.S. states during 1993-1995

State of residence	1993 HemA No.	1993 HemB No.	1994 HemA No.	1994 HemB No.	1995 HemA No.	1995 HemB No.
All States	17	16	18	16	14	17

Table 15. Age distribution of female hemophilia cases residing in six U.S. states during 1993-1995

	Age Group (years)					
	0- 9	10-19	20-29	30-39	40+	Total
N	5	7	8	8	8	36
%	14	20	22	22	22	

Table 16. Distribution of female hemophilia cases residing in six U.S. states by severity level

	Severity Level**				
	Mild	Moderate	Severe	Unknown	TOTAL
N	22	8	5	1	36
%	61	22	14	3	

*Physician-diagnosed hemophilia; symptomatic hemophilia carriers were excluded. See Technical Notes.
**Mild is factor activity (FA) 6%-30% of normal; Moderate is FA 1%-5% of normal; Severe is FA <1% of normal.

Technical Notes

Surveillance Definitions

A definitive hemophilia case was defined as a person with physician-diagnosed hemophilia A or B and a baseline clotting factor activity level of ≤ 30%. A presumptive hemophilia case was defined as a person with either a physician diagnosis of hemophilia A or B or a measured factor VIII or IX activity level of ≤ 30%. Persons with factor activity levels >30% of normal, acquired inhibitors of factor VIII or IX, and carriers of the hemophilia gene were excluded. All tables include both presumptive and definitive cases. Severity level was categorized as mild if the activity level was 6%-30%, moderate if 1%-5%, and severe if <1% of normal. In cases with more than one available measurement of factor activity level, the lowest value was used to determine severity.

Because cases were identified primarily through contacts with the medical care system and since medical care visits did not occur in every year of the surveillance, cases were assigned a study status according to the following guidelines. Cases among persons who had a medical care visit at any time during the calendar year were considered "active." Those who did not have a medical care visit during the calendar year but whose residence and vital status could be verified in some other way were considered "inactive." Cases among persons with no medical visit and no verification of residence or vital status were considered "lost." These cases were assumed to be residents of the state for up to 5 years after their last medical care visit. After that time, cases with "lost" status were no longer counted as resident cases. Cases among persons who were known to have moved out of the surveillance state were listed as "transferred" in the year *after* they moved. Therefore, cases were counted as long as they were residents of a surveillance state for any part of a calendar year.

Age was calculated based on the first day of the year after the current surveillance year. This was done so that incident cases would not have an age less than zero. Information on race or ethnicity was obtained from medical records and may have been based either on self-report or on observations made by care providers.

Cases were considered to be seropositive for HIV if information in their medical record indicated that the person had ever tested positive for HIV-1 antibody. Similarly, cases were considered seronegative based on evidence of a negative test for HIV-1 antibody. Cases for whom no evidence of HIV-1 antibody testing could be found were categorized as having unknown HIV status.

Among persons with hemophilia who were HIV-1 seropositive, cases were considered to have AIDS if information available in the medical record indicated that they met the CDC surveillance case definition for AIDS (*MMWR* 1992;41[no. RR-17]: 1-19; see also *MMWR* 1995;44:64-67). For surveillance of AIDS-indicator diseases, those diseases listed in the surveillance case definition were considered.

Data collection and quality control

Cases were identified using a wide variety of approaches that utilized resources available to the health departments of the surveillance states. These methods included contacting physicians and hematologists, clinical laboratories, hemophilia treatment centers, factor concentrate suppliers, pharmacies, and other potential providers of care or supplies for this population. In some states, databases such as hospital-discharge records and Medicare

claims data were reviewed. The completeness of case ascertainment was evaluated in each state using several formal and informal strategies.

Once cases were identified, trained data abstractors collected data using standardized data collection forms. Project staff were trained by CDC personnel and were provided a detailed procedures manual. Specific questions about data abstraction that arose during the project were addressed by CDC epidemiologic support staff who also monitored the progress of data collection and made periodic site visits to evaluate facilities, assess procedures, and meet with health department and surveillance staff to discuss local issues and concerns.

Information from all medical care encounters during the year was aggregated prior to entry into a computerized database using software that required double-key entry to limit the number of data-entry errors.

Data stored in local databases were periodically transmitted without patient identifiers to CDC for analysis. All transmitted data were screened for omissions, inconsistencies, and unusual values that possibly represented abstraction or data-entry errors. Data queries were electronically transmitted to the data-collection site and study staff used available information to resolve discrepancies and to update the database as necessary.

Tabulation and presentation of data

Data in this report are provisional. Data are presented separately for male and female hemophilia cases. True hemophilia cases among women are extremely rare because of the requirement of a maternal carrier and a father with hemophilia. Although the surveillance specifically excluded symptomatic carriers, from a practical standpoint, some of the women included in Tables 14-16 with physician-diagnosed hemophilia may have been misdiagnosed. Therefore, this information should be interpreted with caution.

The data presented in this report represent the first 3 years of a six-year surveillance project. The HSS project anticipates funding through fiscal year 1999 to permit case ascertainment and data collection through calendar year 1998. Future reports will expand the data tables to include information collected in subsequent surveillance years.

This initial report is focused primarily on the demographic and clinical characteristics of the hemophilia population in the surveillance states. Subsequent surveillance system reports will include tables that present other data collected as part of the surveillance including information on: a) medical sources of hemophilia care and reimbursement; b) the number of bleeding episodes experienced among persons with hemophilia; c) the amount and sources of clotting factor used by persons with hemophilia to control bleeding episodes; d) the results of laboratory testing for exposure to infectious diseases; e) the results of assessments of joint ranges of motion; and f) the number, duration, and reasons for hospitalizations.

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